

SEQUENCE LISTING

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<120> NPC1L1 (NPC3) AND METHODS OF USE THEREOF

<130> JB01603K2 US

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<141> 2003-09-16

<150> 60/397,442

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<160> 50

<170> PatentIn version 3.1

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acc ttt tac gaa gag tgc ggg aaa aac cca gag ctc tct gga ggc ctc 144  
Thr Phe Tyr Glu Glu Cys Gly Lys Asn Pro Glu Leu Ser Gly Gly Leu  
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acg tca cta tcc aat gta tcc tgc ctg tct aac acc ccg gcc cgcc cac 192  
Thr Ser Leu Ser Asn Val Ser Cys Leu Ser Asn Thr Pro Ala Arg His  
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Val Thr Gly Glu His Leu Ala Leu Leu Gln Arg Ile Cys Pro Arg Leu  
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Tyr Asn Gly Pro Asn Thr Thr Phe Ala Cys Cys Ser Thr Lys Gln Leu  
85 90 95  
ctg tcc tta gaa agc agc atg tcc atc acc aag gcc ctt ctc acg cgcc 336  
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Cys Pro Ala Cys Ser Asp Asn Phe Val Ser Leu His Cys His Asn Thr  
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Gln Arg Ser Phe Ala Glu Lys Ala Tyr Glu Ser Cys Ser Gln Val Arg  
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Ile Pro Ala Ala Ala Ser Leu Ala Val Gly Ser Met Cys Gly Val Tyr  
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ctg acc ccg tcc tcc tcc tgt cgc ctt tat ata cgt ggc ccc cat			2928
Leu Thr Pro Ser Ser Cys Cys Arg Leu Tyr Ile Arg Gly Pro His			
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Lys Asp Glu Phe Cys Pro Ser Thr Asp Thr Ser Phe Asn Cys Leu Lys			
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Asn Cys Met Asn Arg Thr Leu Gly Pro Val Arg Pro Thr Ala Glu Gln			
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ttt cat aag tac ctg ccc tgg ttc ctg aat gat ccg ccc aat atc			3069
Phe His Lys Tyr Leu Pro Trp Phe Leu Asn Asp Pro Pro Asn Ile			
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Arg Cys Pro Lys Gly Gly Leu Ala Ala Tyr Arg Thr Ser Val Asn			
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Leu Ser Ser Asp Gly Gln Val Ile Ala Ser Gln Phe Met Ala Tyr			
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His Lys Pro Leu Arg Asn Ser Gln Asp Phe Thr Glu Ala Leu Arg			
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Ala Ser Arg Leu Leu Ala Ala Asn Ile Thr Ala Asp Leu Arg Lys			
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gtg cct ggg aca gat cca aac ttt gag gtc ttc cct tac acg atc			3294
Val Pro Gly Thr Asp Pro Asn Phe Glu Val Phe Pro Tyr Thr Ile			
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Ser Asn Val Phe Tyr Gln Gln Tyr Leu Thr Val Leu Pro Glu Gly			
1100	1105	1110	
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Ile Phe Thr Leu Ala Leu Cys Phe Val Pro Thr Phe Val Val Cys			
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Tyr Leu Leu Leu Gly Leu Asp Met Cys Ser Gly Ile Leu Asn Leu			
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ctc tcc atc att atg att ctc gtg gac acc att ggc ctc atg gct			3474
Leu Ser Ile Ile Met Ile Leu Val Asp Thr Ile Gly Leu Met Ala			
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Val Trp Gly Ile Ser Tyr Asn Ala Val Ser Leu Ile Asn Leu Val			
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Thr Ala Val Gly Met Ser Val Glu Phe Val Ser His Ile Thr Arg			

1175	1180	1185	
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Ser Phe Ala Val Ser Thr Lys	Pro Thr Arg Leu Glu	Arg Ala Lys	
1190	1195	1200	
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Asp Ala Thr Val Phe Met Gly	Ser Ala Val Phe Ala	Gly Val Ala	
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Met Thr Asn Phe Pro Gly Ile	Leu Ile Leu Gly Phe	Ala Gln Ala	
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Leu Leu Gly Leu Leu His Gly	Leu Val Phe Leu Pro	Val Val Leu	
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Ser Tyr Leu Gly Pro Asp Val	Asn Gln Ala Leu Val	Gln Glu Glu	
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aaa cta gcc agc gag gca gca	gtg gcc cca gag cct	tct tgc cca	3879
Lys Leu Ala Ser Glu Ala Ala	Val Ala Pro Glu Pro	Ser Cys Pro	
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Gln Tyr Pro Ser Pro Ala Asp	Ala Asp Ala Asn Val	Asn Tyr Gly	
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Phe Ala Pro Glu Leu Ala His	Gly Ala Asn Ala Ala	Arg Ser Ser	
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Val Thr Gly Glu His Leu Ala Leu Leu Gln Arg Ile Cys Pro Arg Leu  
65 70 75 80

Tyr Asn Gly Pro Asn Thr Thr Phe Ala Cys Cys Ser Thr Lys Gln Leu  
85 90 95

Leu Ser Leu Glu Ser Ser Met Ser Ile Thr Lys Ala Leu Leu Thr Arg  
100 105 110

Cys Pro Ala Cys Ser Asp Asn Phe Val Ser Leu His Cys His Asn Thr  
115 120 125

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Gln Arg Ser Phe Ala Glu Lys Ala Tyr Glu Ser Cys Ser Gln Val Arg  
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Gly Ser Ala Leu Cys Asn Ala Gln Arg Trp Leu Asn Phe Gln Gly Asp  
195 200 205

Thr Gly Asn Gly Leu Ala Pro Leu Asp Ile Thr Phe His Leu Leu Glu  
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Pro Gly Gln Ala Leu Pro Asp Gly Ile Gln Pro Leu Asn Gly Lys Ile  
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Ala Pro Cys Asn Glu Ser Gln Gly Asp Asp Ser Ala Val Cys Ser Cys  
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Gln Asp Cys Ala Ala Ser Cys Pro Val Ile Pro Pro Pro Glu Ala Leu  
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305 310 315 320

Glu Ala Pro Lys Leu Pro His Lys His Lys Leu Ser Pro His Thr Ile  
325 330 335

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340 345 350

Leu Thr Val Leu Ala Leu Ser Phe Ile Val Val Ile Ala Leu Ala Ala  
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Gly Leu Thr Phe Ile Glu Leu Thr Thr Asp Pro Val Glu Leu Trp Ser  
370 375 380

Ala Pro Lys Ser Gln Ala Arg Lys Glu Lys Ser Phe His Asp Glu His  
385 390 395 400

Phe Gly Pro Phe Phe Arg Thr Asn Gln Ile Phe Val Thr Ala Arg Asn  
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Ser Gly Ile Leu Ser Leu Asp Phe Leu Leu Glu Leu Leu Glu Leu Gln  
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595 600 605

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Cys Ser Arg Val Ala Val Glu Ser Lys Ala Thr Leu Gly Leu Gly Gly  
660 665 670

Val Ile Val Val Leu Gly Ala Val Leu Ala Ala Met Gly Phe Tyr Ser  
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Tyr Leu Gly Val Pro Ser Ser Leu Val Ile Ile Gln Val Val Pro Phe  
690 695 700

Leu Val Leu Ala Val Gly Ala Asp Asn Ile Phe Ile Phe Val Leu Glu  
705 710 715 720

Tyr Gln Arg Leu Pro Arg Met Pro Gly Glu Gln Arg Glu Ala His Ile  
725 730 735

Gly Arg Thr Leu Gly Ser Val Ala Pro Ser Met Leu Leu Cys Ser Leu  
740 745 750

Ser Glu Ala Ile Cys Phe Phe Leu Gly Ala Leu Thr Pro Met Pro Ala

755

760

765

Val Arg Thr Phe Ala Leu Thr Ser Gly Leu Ala Ile Ile Leu Asp Phe  
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Lys Leu Pro Pro Pro Lys Glu Lys Gly Leu Leu Leu Arg Phe Phe  
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Val Met Leu Leu Phe Leu Thr Leu Phe Gly Ala Asn Leu Tyr Leu Met  
 850 855 860

Cys Asn Ile Asn Val Gly Leu Asp Gln Glu Leu Ala Leu Pro Lys Asp  
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Ser Tyr Leu Ile Asp Tyr Phe Leu Phe Leu Asn Arg Tyr Leu Glu Val  
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Gly Pro Pro Val Tyr Phe Val Thr Thr Ser Gly Phe Asn Phe Ser Ser  
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Phe His Lys Tyr Leu Pro Trp Phe Leu Asn Asp Pro Pro Asn Ile  
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His Lys Pro Leu Arg Asn Ser Gln Asp Phe Thr Glu Ala Leu Arg  
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Ser Phe Ala Val Ser Thr Lys Pro Thr Arg Leu Glu Arg Ala Lys  
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1265 1270 1275

Lys Leu Ala Ser Glu Ala Ala Val Ala Pro Glu Pro Ser Cys Pro  
1280 1285 1290

Gln Tyr Pro Ser Pro Ala Asp Ala Asp Ala Asn Val Asn Tyr Gly  
1295 1300 1305

Phe Ala Pro Glu Leu Ala His Gly Ala Asn Ala Ala Arg Ser Ser  
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1 5 10 15

cgc ttg gcc cag agt gag cct tac aca acc atc cac cag cct ggc tac 96  
Arg Leu Ala Gln Ser Glu Pro Tyr Thr Thr Ile His Gln Pro Gly Tyr  
20 25 30

tgc gcc ttc tat gac gaa tgt ggg aag aac cca gag ctg tct gga agc 144  
Cys Ala Phe Tyr Asp Glu Cys Gly Lys Asn Pro Glu Leu Ser Gly Ser  
35 40 45

ctc atg aca ctc tcc aac gtg tcc tgc ctg tcc aac acg ccg gcc cgc		192	
Leu Met Thr Leu Ser Asn Val Ser Cys Leu Ser Asn Thr Pro Ala Arg			
50	55	60	
aag atc aca ggt gat cac ctg atc cta tta cag aag atc tgc ccc cgc		240	
Lys Ile Thr Gly Asp His Leu Ile Leu Gln Lys Ile Cys Pro Arg			
65	70	75	80
ctc tac acc ggc ccc aac acc caa gcc tgc tgc tcc gcc aag cag ctg		288	
Leu Tyr Thr Gly Pro Asn Thr Gln Ala Cys Cys Ser Ala Lys Gln Leu			
85	90	95	
gta tca ctg gaa gcg agt ctg tcg atc acc aag gcc ctc ctc acc cgc		336	
Val Ser Leu Glu Ala Ser Leu Ser Ile Thr Lys Ala Leu Thr Arg			
100	105	110	
tgc cca gcc tgc tct gac aat ttt gtg aac ctg cac tgc cac aac acg		384	
Cys Pro Ala Cys Ser Asp Asn Phe Val Asn Leu His Cys His Asn Thr			
115	120	125	
tgc agc ccc aat cag agc ctc ttc atc aat gtg acc cgc gtg gcc cag		432	
Cys Ser Pro Asn Gln Ser Leu Phe Ile Asn Val Thr Arg Val Ala Gln			
130	135	140	
cta ggg gct gga caa ctc cca gct gtg gtg gcc tat gag gcc ttc tac		480	
Leu Gly Ala Gly Gln Leu Pro Ala Val Val Ala Tyr Glu Ala Phe Tyr			
145	150	155	160
cag cat agc ttt gcc gag cag agc tat gac tcc tgc agc cgt gtg cgc		528	
Gln His Ser Phe Ala Glu Gln Ser Tyr Asp Ser Cys Ser Arg Val Arg			
165	170	175	
gtc cct gca gct gcc acg ctg gct gtg ggc acc atg tgt ggc gtg tat		576	
Val Pro Ala Ala Ala Thr Leu Ala Val Gly Thr Met Cys Gly Val Tyr			
180	185	190	
ggc tct gcc ctt tgc aat gcc cag cgc tgg ctc aac ttc cag gga gac		624	
Gly Ser Ala Leu Cys Asn Ala Gln Arg Trp Leu Asn Phe Gln Gly Asp			
195	200	205	
aca ggc aat ggt ctg gcc cca ctg gac atc acc ttc cac ctc ttg gag		672	
Thr Gly Asn Gly Leu Ala Pro Leu Asp Ile Thr Phe His Leu Leu Glu			
210	215	220	
cct ggc cag gcc gtg ggg agt ggg att cag cct ctg aat gag ggg gtt		720	
Pro Gly Gln Ala Val Gly Ser Gly Ile Gln Pro Leu Asn Glu Gly Val			
225	230	235	240
gca cgt tgc aat gag tcc caa ggt gac gac gtg gcg acc tgc tcc tgc		768	
Ala Arg Cys Asn Glu Ser Gln Gly Asp Asp Val Ala Thr Cys Ser Cys			
245	250	255	
caa gac tgt gca tcc tgt cct gcc ata gcc cgc ccc cag gcc ctc		816	
Gln Asp Cys Ala Ala Ser Cys Pro Ala Ile Ala Arg Pro Gln Ala Leu			
260	265	270	
gac tcc acc ttc tac ctg ggc cag atg ccg ggc agt ctg gtc ctc atc		864	
Asp Ser Thr Phe Tyr Leu Gly Gln Met Pro Gly Ser Leu Val Leu Ile			
275	280	285	

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290 295 300	
ttc cgt gtg gcc ccc gcc agg gac aaa agc aag atg gtg gac ccc aag Phe Arg Val Ala Pro Ala Arg Asp Lys Ser Lys Met Val Asp Pro Lys	960
305 310 315 320	
aag ggc acc agc ctc tct gac aag ctc agc ttc tcc acc cac acc ctc Lys Gly Thr Ser Leu Ser Asp Lys Leu Ser Phe Ser Thr His Thr Leu	1008
325 330 335	
ctt ggc cag ttc cag ggc tgg ggc acg tgg gtg gct tcg tgg cct Leu Gly Gln Phe Phe Gln Gly Trp Gly Thr Trp Val Ala Ser Trp Pro	1056
340 345 350	
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355 360 365	
ggc ctg gtc ttt aca gaa ctc act acg gac ccc gtg gag ctg tgg tcg Gly Leu Val Phe Thr Glu Leu Thr Thr Asp Pro Val Glu Leu Trp Ser	1152
370 375 380	
gcc ccc aac agc caa gcc cggtt gat gag aaa gct ttc cat gac cag cat Ala Pro Asn Ser Gln Ala Arg Ser Glu Lys Ala Phe His Asp Gln His	1200
385 390 395 400	
ttc ggc ccc ttc ttc cga acc aac cag gtg atc ctg acg gct cct aac Phe Gly Pro Phe Phe Arg Thr Asn Gln Val Ile Leu Thr Ala Pro Asn	1248
405 410 415	
cgg tcc agc tac agg tat gac tct ctg ctg ggg ccc aag aac ttc Arg Ser Ser Tyr Arg Tyr Asp Ser Leu Leu Leu Gly Pro Lys Asn Phe	1296
420 425 430	
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435 440 445	
gag agg ctg cgg cac ctc cag gta tgg tcg ccc gaa gca cag cgc aac Glu Arg Leu Arg His Leu Gln Val Trp Ser Pro Glu Ala Gln Arg Asn	1392
450 455 460	
atc tcc ctg cag gac atc tgc tac gcc ccc ctc aat ccg gac aat acc Ile Ser Leu Gln Asp Ile Cys Tyr Ala Pro Leu Asn Pro Asp Asn Thr	1440
465 470 475 480	
agt ctc tac gac tgc tgc atc aac agc ctc ctg cag tat ttc cag aac Ser Leu Tyr Asp Cys Cys Ile Asn Ser Leu Leu Gln Tyr Phe Gln Asn	1488
485 490 495	
aac cgc acg ctc ctg ctc aca gcc aac cag aca ctg atg ggg cag Asn Arg Thr Leu Leu Leu Thr Ala Asn Gln Thr Leu Met Gly Gln	1536
500 505 510	
acc tcc caa gtc gac tgg aag gac cat ttt ctg tac tgt gcc aat gcc Thr Ser Gln Val Asp Trp Lys Asp His Phe Leu Tyr Cys Ala Asn Ala	1584
515 520 525	
ccg ctc acc ttc aag gat ggc aca gcc ctg gcc ctg agc tgc atg gct	1632

Pro	Leu	Thr	Phe	Lys	Asp	Gly	Thr	Ala	Leu	Ala	Leu	Ser	Cys	Met	Ala	
530					535											540
gac tac ggg gcc cct gtc ttc ccc ttc ctt gcc att ggg ggg tac aaa															1680	
Asp	Tyr	Gly	Ala	Pro	Val	Phe	Pro	Phe	Leu	Ala	Ile	Gly	Gly	Tyr	Lys	
545					550						555					560
gga aag gac tat tct gag gca gag gcc ctg atc atg acg ttc tcc ctc															1728	
Gly	Lys	Asp	Tyr	Ser	Glu	Ala	Glu	Ala	Leu	Ile	Met	Thr	Phe	Ser	Leu	
565					570						575					
aac aat tac cct gcc ggg gac ccc cgt ctg gcc cag gcc aag ctg tgg															1776	
Asn	Asn	Tyr	Pro	Ala	Gly	Asp	Pro	Arg	Leu	Ala	Gln	Ala	Lys	Leu	Trp	
580					585						590					
gag gag gcc ttc tta gag gaa atg cga gcc ttc cag cgt cgg atg gct															1824	
Glu	Glu	Ala	Phe	Leu	Glu	Glu	Met	Arg	Ala	Phe	Gln	Arg	Arg	Met	Ala	
595					600						605					
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Gly	Met	Phe	Gln	Val	Thr	Phe	Thr	Ala	Glu	Arg	Ser	Leu	Glu	Asp	Glu	
610					615						620					
atc aat cgc acc aca gct gaa gac ctg ccc atc ttt gcc acc agc tac															1920	
Ile	Asn	Arg	Thr	Thr	Ala	Glu	Asp	Leu	Pro	Ile	Phe	Ala	Thr	Ser	Tyr	
625					630						635					640
att gtc ata ttc ctg tac atc tct ctg gcc ctg ggc agc tat tcc agc															1968	
Ile	Val	Ile	Phe	Leu	Tyr	Ile	Ser	Leu	Ala	Leu	Gly	Ser	Tyr	Ser	Ser	
645					650						655					
tgg agc cga gtg atg gtg gac tcc aag gcc acg ctg ggc ctc ggc ggg															2016	
Trp	Ser	Arg	Val	Met	Val	Asp	Ser	Lys	Ala	Thr	Leu	Gly	Leu	Gly	Gly	
660					665						670					
gtg gcc gtg gtc ctg gga gca gtc atg gct gcc atg ggc ttc ttc tcc															2064	
Val	Ala	Val	Val	Leu	Gly	Ala	Val	Met	Ala	Ala	Met	Gly	Phe	Phe	Ser	
675					680						685					
tac ttg ggt atc cgc tcc tcc ctg gtc atc ctg caa gtg gtt cct ttc															2112	
Tyr	Leu	Gly	Ile	Arg	Ser	Ser	Leu	Val	Ile	Leu	Gln	Val	Val	Pro	Phe	
690					695						700					
ctg gtg ctg tcc gtg ggg gct gat aac atc ttc atc ttt gtt ctc gag															2160	
Leu	Val	Leu	Ser	Val	Gly	Ala	Asp	Asn	Ile	Phe	Ile	Phe	Val	Leu	Glu	
705					710						715					720
tac cag agg ctg ccc cgg agg cct ggg gag cca cga gag gtc cac att															2208	
Tyr	Gln	Arg	Leu	Pro	Arg	Arg	Pro	Gly	Glu	Pro	Arg	Glu	Val	His	Ile	
725					730						735					
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Gly	Arg	Ala	Leu	Gly	Arg	Val	Ala	Pro	Ser	Met	Leu	Leu	Cys	Ser	Leu	
740					745						750					
tct gag gcc atc tgc ttc cta ggg gcc ctg acc ccc atg cca gct															2304	
Ser	Glu	Ala	Ile	Cys	Phe	Phe	Leu	Gly	Ala	Leu	Thr	Pro	Met	Pro	Ala	
755					760						765					
gtg cgg acc ttt gcc ctg acc tct ggc ctt gca gtg atc ctt gac ttc															2352	
Val	Arg	Thr	Phe	Ala	Leu	Thr	Ser	Gly	Leu	Ala	Val	Ile	Leu	Asp	Phe	

770	775	780	
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agg cag gag gcc tcc cggtt gac gtc tgc tgc tgt gtc aag ccc cag Arg Gln Glu Ala Ser Arg Leu Asp Val Cys Cys Cys Val Lys Pro Gln 805 810 815			2448
gag ctg ccc ccg cct ggc cag gga gag ggg ctc ctg ctt ggc ttc ttc Glu Leu Pro Pro Gly Gln Gly Glu Gly Leu Leu Leu Gly Phe Phe 820 825 830			2496
caa aag gct tat gcc ccc ttc ctg ctg cac tgg atc act cga ggt gtt Gln Lys Ala Tyr Ala Pro Phe Leu Leu His Trp Ile Thr Arg Gly Val 835 840 845			2544
gtg ctg ctg ctg ttt ctc gcc ctg ttc gga gtg agc ctc tac tcc atg Val Leu Leu Leu Phe Leu Ala Leu Phe Gly Val Ser Leu Tyr Ser Met 850 855 860			2592
tgc cac atc agc gtg gga ctg gac cag gag ctg gcc ctg ccc aag gac Cys His Ile Ser Val Gly Leu Asp Gln Glu Leu Ala Leu Pro Lys Asp 865 870 875 880			2640
tcg tac ctg ctt gac tat ttc ctc ttt ctg aac cgc tac ttc gag gtg Ser Tyr Leu Leu Asp Tyr Phe Leu Phe Leu Asn Arg Tyr Phe Glu Val 885 890 895			2688
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gag gct ggg atg aat gcc atc tgc tcc agt gca ggc tgc aac aac ttc Glu Ala Gly Met Asn Ala Ile Cys Ser Ser Ala Gly Cys Asn Asn Phe 915 920 925			2784
tcc ttc acc cag aag atc cag tat gcc aca gag ttc cct gag cag tct Ser Phe Thr Gln Lys Ile Gln Tyr Ala Thr Glu Phe Pro Glu Gln Ser 930 935 940			2832
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gac aag ttc tgc ccc tcg acc gtc aac tct ctg aac tgc cta aag aac Asp Lys Phe Cys Pro Ser Thr Val Asn Ser Leu Asn Cys Leu Lys Asn 980 985 990			2976
tgc atg agc atc acg atg ggc tct gtg agg ccc tcg gtg gag cag ttc Cys Met Ser Ile Thr Met Gly Ser Val Arg Pro Ser Val Glu Gln Phe 995 1000 1005			3024
cat aag tat ctt ccc tgg ttc ctg aac gac cgg ccc aac atc aaa His Lys Tyr Leu Pro Trp Phe Leu Asn Asp Arg Pro Asn Ile Lys 1010 1015 1020			3069

tgt ccc	aaa ggc ggc ctg gca	gca tac agc acc tct	gtg aac ttg	3114
Cys Pro	Lys Gly Gly Leu Ala	Ala Tyr Ser Thr Ser	Val Asn Leu	
1025	1030	1035		
act tca	gat ggc cag gtt tta	gcc tcc agg ttc atg	gcc tat cac	3159
Thr Ser	Asp Gly Gln Val Leu	Ala Ser Arg Phe Met	Ala Tyr His	
1040	1045	1050		
aag ccc	ctg aaa aac tca cag	gat tac aca gaa gct	ctg cgg gca	3204
Lys Pro	Leu Lys Asn Ser Gln	Asp Tyr Thr Glu Ala	Leu Arg Ala	
1055	1060	1065		
gct cga	gag ctg gca gcc aac	atc act gct gac ctg	cgg aaa gtg	3249
Ala Arg	Glu Leu Ala Ala Asn	Ile Thr Ala Asp Leu	Arg Lys Val	
1070	1075	1080		
cct gga	aca gac ccg gct ttt	gag gtc ttc ccc tac	acg atc acc	3294
Pro Gly	Thr Asp Pro Ala Phe	Glu Val Phe Pro Tyr	Thr Ile Thr	
1085	1090	1095		
aat gtg	ttt tat gag cag tac	ctg acc atc ctc cct	gag ggg ctc	3339
Asn Val	Phe Tyr Glu Gln Tyr	Leu Thr Ile Leu Pro	Glu Gly Leu	
1100	1105	1110		
ttc atg	ctc agc ctc tgc ctt	gtg ccc acc ttc gct	gtc tcc tgc	3384
Phe Met	Leu Ser Leu Cys Leu	Val Pro Thr Phe Ala	Val Ser Cys	
1115	1120	1125		
ctc ctg	ctg ggc ctg gac ctg	cgc tcc ggc ctc ctc	aac ctg ctc	3429
Leu Leu	Leu Gly Leu Asp Leu	Arg Ser Gly Leu Leu	Asn Leu Leu	
1130	1135	1140		
tcc att	gtc atg atc ctc gtg	gac act gtc ggc ttc	atg gcc ctg	3474
Ser Ile	Val Met Ile Leu Val	Asp Thr Val Gly Phe	Met Ala Leu	
1145	1150	1155		
tgg gac	atc agt tac aat gct	gtg tcc ctc atc aac	ctg gtc tcg	3519
Trp Asp	Ile Ser Tyr Asn Ala	Val Ser Leu Ile Asn	Leu Val Ser	
1160	1165	1170		
gcg gtg	ggc atg tct gtg gag	ttt gtg tcc cac att	acc cgc tcc	3564
Ala Val	Gly Met Ser Val Glu	Phe Val Ser His Ile	Thr Arg Ser	
1175	1180	1185		
ttt gcc	atc agc acc aag ccc	acc tgg ctg gag agg	gcc aaa gag	3609
Phe Ala	Ile Ser Thr Lys Pro	Thr Trp Leu Glu Arg	Ala Lys Glu	
1190	1195	1200		
gcc acc	atc tct atg gga agt	gcg gtg ttt gca ggt	gtg gcc atg	3654
Ala Thr	Ile Ser Met Gly Ser	Ala Val Phe Ala Gly	Val Ala Met	
1205	1210	1215		
acc aac	ctg cct ggc atc ctt	gtc ctg ggc ctc gcc	aag gcc cag	3699
Thr Asn	Leu Pro Gly Ile Leu	Val Leu Gly Leu Ala	Lys Ala Gln	
1220	1225	1230		
ctc att	cag atc ttc ttc ttc	cgc ctc aac ctc ctg	atc act ctg	3744
Leu Ile	Gln Ile Phe Phe Arg	Leu Asn Leu Leu	Ile Thr Leu	
1235	1240	1245		

ctg ggc	ctg ctg cat ggc ttg	gtc ttc ctg ccc gtc	atc ctc agc	3789
Leu Gly	Leu Leu His Gly Leu	Val Phe Leu Pro Val	Ile Leu Ser	
1250	1255	1260		
tac gtg	ggg cct gac gtt aac	ccg gct ctg gca ctg	gag cag aag	3834
Tyr Val	Gly Pro Asp Val Asn	Pro Ala Leu Ala Leu	Glu Gln Lys	
1265	1270	1275		
cgg gct	gag gag gcg gtg gca	gca gtc atg gtg gcc	tct tgc cca	3879
Arg Ala	Glu Glu Ala Val Ala	Ala Val Met Val Ala	Ser Cys Pro	
1280	1285	1290		
aat cac	ccc tcc cga gtc tcc	aca gct gac aac atc	tat gtc aac	3924
Asn His	Pro Ser Arg Val Ser	Thr Ala Asp Asn Ile	Tyr Val Asn	
1295	1300	1305		
cac agc	ttt gaa ggt tct atc	aaa ggt gct ggt gcc	atc agc aac	3969
His Ser	Phe Glu Gly Ser Ile	Lys Gly Ala Gly Ala	Ile Ser Asn	
1310	1315	1320		
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Phe Leu	Pro Asn Asn Gly Arg	Gln Phe		
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Cys Ala Phe Tyr Asp Glu Cys Gly Lys Asn Pro Glu Leu Ser Gly Ser			
35	40	45	

Leu Met Thr Leu Ser Asn Val Ser Cys Leu Ser Asn Thr Pro Ala Arg			
50	55	60	

Lys Ile Thr Gly Asp His Leu Ile Leu Leu Gln Lys Ile Cys Pro Arg			
65	70	75	80

Leu Tyr Thr Gly Pro Asn Thr Gln Ala Cys Cys Ser Ala Lys Gln Leu			
85	90	95	

Val Ser Leu Glu Ala Ser Leu Ser Ile Thr Lys Ala Leu Leu Thr Arg  
100 105 110

Cys Pro Ala Cys Ser Asp Asn Phe Val Asn Leu His Cys His Asn Thr  
115 120 125

Cys Ser Pro Asn Gln Ser Leu Phe Ile Asn Val Thr Arg Val Ala Gln  
130 135 140

Leu Gly Ala Gly Gln Leu Pro Ala Val Val Ala Tyr Glu Ala Phe Tyr  
145 150 155 160

Gln His Ser Phe Ala Glu Gln Ser Tyr Asp Ser Cys Ser Arg Val Arg  
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Val Pro Ala Ala Ala Thr Leu Ala Val Gly Thr Met Cys Gly Val Tyr  
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Gly Ser Ala Leu Cys Asn Ala Gln Arg Trp Leu Asn Phe Gln Gly Asp  
195 200 205

Thr Gly Asn Gly Leu Ala Pro Leu Asp Ile Thr Phe His Leu Leu Glu  
210 215 220

Pro Gly Gln Ala Val Gly Ser Gly Ile Gln Pro Leu Asn Glu Gly Val  
225 230 235 240

Ala Arg Cys Asn Glu Ser Gln Gly Asp Asp Val Ala Thr Cys Ser Cys  
245 250 255

Gln Asp Cys Ala Ala Ser Cys Pro Ala Ile Ala Arg Pro Gln Ala Leu  
260 265 270

Asp Ser Thr Phe Tyr Leu Gly Gln Met Pro Gly Ser Leu Val Leu Ile  
275 280 285

Ile Ile Leu Cys Ser Val Phe Ala Val Val Thr Ile Leu Leu Val Gly  
290 295 300

Phe Arg Val Ala Pro Ala Arg Asp Lys Ser Lys Met Val Asp Pro Lys  
305 310 315 320

Lys Gly Thr Ser Leu Ser Asp Lys Leu Ser Phe Ser Thr His Thr Leu  
325 330 335

Leu Gly Gln Phe Phe Gln Gly Trp Gly Thr Trp Val Ala Ser Trp Pro

340

345

350

Leu Thr Ile Leu Val Leu Ser Val Ile Pro Val Val Ala Leu Ala Ala  
355 360 365

Gly Leu Val Phe Thr Glu Leu Thr Thr Asp Pro Val Glu Leu Trp Ser  
 370 375 380

Ala Pro Asn Ser Gln Ala Arg Ser Glu Lys Ala Phe His Asp Gln His  
385 390 395 400

Phe Gly Pro Phe Phe Arg Thr Asn Gln Val Ile Leu Thr Ala Pro Asn  
405 410 415

Arg Ser Ser Tyr Arg Tyr Asp Ser Leu Leu Leu Gly Pro Lys Asn Phe  
 420 425 430

Ser Gly Ile Leu Asp Leu Asp Leu Leu Leu Glu Leu Leu Glu Leu Gln  
435 440 445

Glu Arg Leu Arg His Leu Gln Val Trp Ser Pro Glu Ala Gln Arg Asn  
450 455 460

Ile Ser Leu Gln Asp Ile Cys Tyr Ala Pro Leu Asn Pro Asp Asn Thr  
465 470 475 480

Ser Leu Tyr Asp Cys Cys Ile Asn Ser Leu Leu Gln Tyr Phe Gln Asn  
                   485                   490                   495

Asn	Arg	Thr	Leu	Leu	Leu	Leu	Thr	Ala	Asn	Gln	Thr	Leu	Met	Gly	Gln
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Thr Ser Gln Val Asp Trp Lys Asp His Phe Leu Tyr Cys Ala Asn Ala  
           515                 520                         525

Pro Leu Thr Phe Lys Asp Gly Thr Ala Leu Ala Leu Ser Cys Met Ala  
530 535 540

Asp Tyr Gly Ala Pro Val Phe Pro Phe Leu Ala Ile Gly Gly Tyr Lys  
545 550 555 560

Gly Lys Asp Tyr Ser Glu Ala Glu Ala Leu Ile Met Thr Phe Ser Leu  
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Asn	Asn	Tyr	Pro	Ala	Gly	Asp	Pro	Arg	Leu	Ala	Gln	Ala	Lys	Leu	Trp
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Glu Glu Ala Phe Leu Glu Glu Met Arg Ala Phe Gln Arg Arg Met Ala  
595 600 605

Gly Met Phe Gln Val Thr Phe Thr Ala Glu Arg Ser Leu Glu Asp Glu  
610 615 620

Ile Asn Arg Thr Thr Ala Glu Asp Leu Pro Ile Phe Ala Thr Ser Tyr  
625 630 635 640

Ile Val Ile Phe Leu Tyr Ile Ser Leu Ala Leu Gly Ser Tyr Ser Ser  
645 650 655

Trp Ser Arg Val Met Val Asp Ser Lys Ala Thr Leu Gly Leu Gly Gly  
660 665 670

Val Ala Val Val Leu Gly Ala Val Met Ala Ala Met Gly Phe Phe Ser  
675 680 685

Tyr Leu Gly Ile Arg Ser Ser Leu Val Ile Leu Gln Val Val Pro Phe  
690 695 700

Leu Val Leu Ser Val Gly Ala Asp Asn Ile Phe Ile Phe Val Leu Glu  
705 710 715 720

Tyr Gln Arg Leu Pro Arg Arg Pro Gly Glu Pro Arg Glu Val His Ile  
725 730 735

Gly Arg Ala Leu Gly Arg Val Ala Pro Ser Met Leu Leu Cys Ser Leu  
740 745 750

Ser Glu Ala Ile Cys Phe Phe Leu Gly Ala Leu Thr Pro Met Pro Ala  
755 760 765

Val Arg Thr Phe Ala Leu Thr Ser Gly Leu Ala Val Ile Leu Asp Phe  
770 775 780

Leu Leu Gln Met Ser Ala Phe Val Ala Leu Leu Ser Leu Asp Ser Lys  
785 790 795 800

Arg Gln Glu Ala Ser Arg Leu Asp Val Cys Cys Cys Val Lys Pro Gln  
805 810 815

Glu Leu Pro Pro Pro Gly Gln Gly Glu Gly Leu Leu Leu Gly Phe Phe  
820 825 830

Gln Lys Ala Tyr Ala Pro Phe Leu Leu His Trp Ile Thr Arg Gly Val  
 835 840 845  
 Val Leu Leu Leu Phe Leu Ala Leu Phe Gly Val Ser Leu Tyr Ser Met  
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 Cys His Ile Ser Val Gly Leu Asp Gln Glu Leu Ala Leu Pro Lys Asp  
 865 870 875 880  
 Ser Tyr Leu Leu Asp Tyr Phe Leu Phe Leu Asn Arg Tyr Phe Glu Val  
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 Gly Ala Pro Val Tyr Phe Val Thr Thr Leu Gly Tyr Asn Phe Ser Ser  
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 Leu Thr Pro Ser Ser Cys Cys Arg Leu Tyr Ile Ser Gly Pro Asn Lys  
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Leu Gly Leu Leu His Gly Leu Val Phe Leu Pro Val Ile Leu Ser  
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1295

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1305

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gtngtnytnw sntayytnng nccngaygtn aaycargcny tngtncarga rgaraarytn	3840
gcnwsngarg cngcngtngc nccngarccn wsntgyccnc artayccnws nccngcngay	3900
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1 5 10 15  
  
tcg gcc cag ggt gag ctc tac aca ccc act cac aaa gct ggc ttc tgc 96  
Ser Ala Gln Gly Glu Leu Tyr Thr Pro Thr His Lys Ala Gly Phe Cys  
20 25 30  
  
acc ttt tat gaa gag tgt ggg aag aac cca gag ctt tct gga ggc ctc 144  
Thr Phe Tyr Glu Glu Cys Gly Lys Asn Pro Glu Leu Ser Gly Gly Leu  
35 40 45  
  
aca tca cta tcc aat atc tcc tgc ttg tct aat acc cca gcc cgcc cat 192  
Thr Ser Leu Ser Asn Ile Ser Cys Leu Ser Asn Thr Pro Ala Arg His  
50 55 60  
  
gtc aca ggt gac cac ctg gct ctt ctc cag cgcc gtc tgt ccc cgcc cta 240  
Val Thr Gly Asp His Leu Ala Leu Leu Gln Arg Val Cys Pro Arg Leu  
65 70 75 80  
  
tac aat ggc ccc aat gac acc tat gcc tgt tgc tct acc aag cag ctg 288  
Tyr Asn Gly Pro Asn Asp Thr Tyr Ala Cys Cys Ser Thr Lys Gln Leu  
85 90 95  
  
gtg tca tta gac agt agc ctg tct atc acc aag gcc ctc ctt aca cgcc 336  
Val Ser Leu Asp Ser Ser Leu Ser Ile Thr Lys Ala Leu Leu Thr Arg  
100 105 110  
  
tgc ccg gca tgc tct gaa aat ttt gtg agc ata cac tgt cat aat acc 384  
Cys Pro Ala Cys Ser Glu Asn Phe Val Ser Ile His Cys His Asn Thr  
115 120 125  
  
tgc agc cct gac cag agc ctc ttc atc aat gtt act cgcc gtc gtt cag 432  
Cys Ser Pro Asp Gln Ser Leu Phe Ile Asn Val Thr Arg Val Val Gln  
130 135 140  
  
cgg gac cct gga cag ctt cct gct gtg gtg gcc tat gag gcc ttt tat 480  
Arg Asp Pro Gly Gln Leu Pro Ala Val Val Ala Tyr Glu Ala Phe Tyr

145	150	155	160	
caa cgc agt ttt gca gag aag gcc tat gag tcc tgt agc cgg gtg cgc Gln Arg Ser Phe Ala Glu Lys Ala Tyr Glu Ser Cys Ser Arg Val Arg				528
165	170	175		
atc cct gca gct gcc tcg ctg gct gtg ggc agc atg tgt gga gtg tat Ile Pro Ala Ala Ser Leu Ala Val Gly Ser Met Cys Gly Val Tyr				576
180	185	190		
ggc tct gcc ctc tgc aat gct cag cgc tgg ctc aac ttc caa gga gac Gly Ser Ala Leu Cys Asn Ala Gln Arg Trp Leu Asn Phe Gln Gly Asp				624
195	200	205		
aca ggg aat ggc ctg gct ccg ctg gac atc acc ttc cac ctc ttg gag Thr Gly Asn Gly Leu Ala Pro Leu Asp Ile Thr Phe His Leu Leu Glu				672
210	215	220		
cct ggc cag gcc ctg gca gat ggg atg aag cca ctg gat ggg aag atc Pro Gly Gln Ala Leu Ala Asp Gly Met Lys Pro Leu Asp Gly Lys Ile				720
225	230	235	240	
aca ccc tgc aat gag tcc cag ggt gaa gac tcg gca gcc tgt tcc tgc Thr Pro Cys Asn Glu Ser Gln Gly Glu Asp Ser Ala Ala Cys Ser Cys				768
245	250	255		
cag gac tgt gca gca tcc tgc cct gtc atc cct ccg ccc ccg gcc ctg Gln Asp Cys Ala Ala Ser Cys Pro Val Ile Pro Pro Pro Ala Leu				816
260	265	270		
cgc cct tct ttc tac atg ggt cga atg cca ggc tgg ctg gct ctc atc Arg Pro Ser Phe Tyr Met Gly Arg Met Pro Gly Trp Leu Ala Leu Ile				864
275	280	285		
atc atc ttc act gct gtc ttt gta ttg ctc tct gtt gtc ctt gtg tat Ile Ile Phe Thr Ala Val Phe Val Leu Leu Ser Val Val Leu Val Tyr				912
290	295	300		
ctc cga gtg gct tcc aac agg aac aag aac aca gca ggc tcc cag Leu Arg Val Ala Ser Asn Arg Asn Lys Asn Lys Thr Ala Gly Ser Gln				960
305	310	315	320	
gaa gcc ccc aac ctc cct cgt aag cgc aga ttc tca cct cac act gtc Glu Ala Pro Asn Leu Pro Arg Lys Arg Arg Phe Ser Pro His Thr Val				1008
325	330	335		
ctt ggc cgg ttc ttc gag agc tgg gga aca agg gtg gcc tca tgg cca Leu Gly Arg Phe Glu Ser Trp Gly Thr Arg Val Ala Ser Trp Pro				1056
340	345	350		
ctc act gtc ttg gca ctg tcc ata gtt gtg ata gcc ttg tca gta Leu Thr Val Leu Ala Leu Ser Phe Ile Val Val Ile Ala Leu Ser Val				1104
355	360	365		
gcc ctg acc ttt ata gaa ctc acc aca gac cct gtg gaa ctg tgg tcg Gly Leu Thr Phe Ile Glu Leu Thr Thr Asp Pro Val Glu Leu Trp Ser				1152
370	375	380		
gcc cct aaa agc caa gcc cgg aaa gaa aag gct ttc cat gac gag cat Ala Pro Lys Ser Gln Ala Arg Lys Glu Lys Ala Phe His Asp Glu His				1200
385	390	395	400	

ttt ggc ccc ttc ttc cga acc aac cag att ttt gtg aca gct aag aac Phe Gly Pro Phe Phe Arg Thr Asn Gln Ile Phe Val Thr Ala Lys Asn 405 410 415	1248
agg tcc agc tac aag tac gac tcc ctg ctg cta ggg ccc aag aac ttc Arg Ser Ser Tyr Lys Tyr Asp Ser Leu Leu Leu Gly Pro Lys Asn Phe 420 425 430	1296
agt ggg atc cta tcc ctg gac ttg ctg cag gag ctg ttg gag cta cag Ser Gly Ile Leu Ser Leu Asp Leu Leu Gln Glu Leu Leu Glu Leu Gln 435 440 445	1344
gag aga ctt cga cac ctg caa gtg tgg tcc cat gag gca cag cgc aac Glu Arg Leu Arg His Leu Gln Val Trp Ser His Glu Ala Gln Arg Asn 450 455 460	1392
atc tcc ctc cag gac atc tgc tat gct ccc ctc aac ccg cat aac acc Ile Ser Leu Gln Asp Ile Cys Tyr Ala Pro Leu Asn Pro His Asn Thr 465 470 475 480	1440
agc ctc act gac tgc tgt gtc aac agc ctc ctt caa tac ttc cag aac Ser Leu Thr Asp Cys Cys Val Asn Ser Leu Leu Gln Tyr Phe Gln Asn 485 490 495	1488
aac cac aca ctc ctg ctg ctc aca gcc aat cag act ctg aat ggc cag Asn His Thr Leu Leu Leu Leu Thr Ala Asn Gln Thr Leu Asn Gly Gln 500 505 510	1536
acc tcc ctg gtg gac tgg aag gac cat ttc ctc tac tgt gcc aat gcc Thr Ser Leu Val Asp Trp Lys Asp His Phe Leu Tyr Cys Ala Asn Ala 515 520 525	1584
cct ctc acg tac aaa gat ggc aca gcc ctg gcc ctg agc tgc ata gct Pro Leu Thr Tyr Lys Asp Gly Thr Ala Leu Ala Leu Ser Cys Ile Ala 530 535 540	1632
gac tac ggg gca cct gtc ttc ccc ttc ctt gct gtt ggg ggc tac caa Asp Tyr Gly Ala Pro Val Phe Pro Phe Leu Ala Val Gly Gly Tyr Gln 545 550 555 560	1680
ggg acg gac tac tcg gag gca gaa gcc ctg atc ata acc ttc tct atc Gly Thr Asp Tyr Ser Glu Ala Glu Ala Leu Ile Ile Thr Phe Ser Ile 565 570 575	1728
aat aac tac ccc gct gat gat ccc cgc atg gcc cac gcc aag ctc tgg Asn Asn Tyr Pro Ala Asp Asp Pro Arg Met Ala His Ala Lys Leu Trp 580 585 590	1776
gag gag gct ttc ttg aag gaa atg caa tcc ttc cag aga agc aca gct Glu Glu Ala Phe Leu Lys Glu Met Gln Ser Phe Gln Arg Ser Thr Ala 595 600 605	1824
gac aag ttc cag att gcg ttc tca gct gag cgt tct ctg gag gac gag Asp Lys Phe Gln Ile Ala Phe Ser Ala Glu Arg Ser Leu Glu Asp Glu 610 615 620	1872
atc aat cgc act acc atc cag gac ctg cct gtc ttt gcc atc agc tac Ile Asn Arg Thr Thr Ile Gln Asp Leu Pro Val Phe Ala Ile Ser Tyr 625 630 635 640	1920

ctt atc gtc ttc ctg tac atc tcc ctg gcc ctg ggc agc tac tcc aga Leu Ile Val Phe Leu Tyr Ile Ser Leu Ala Leu Gly Ser Tyr Ser Arg 645	650	655	1968
tgg agc cga gtt gcg gtg gat tcc aag gct act ctg ggc cta ggt ggg Trp Ser Arg Val Ala Val Asp Ser Lys Ala Thr Leu Gly Leu Gly Gly 660	665	670	2016
gtg gct gtt gtg ctg gga gca gtc gtc gct gcc atg ggc ttc tac tcc Val Ala Val Val Leu Gly Ala Val Val Ala Ala Met Gly Phe Tyr Ser 675	680	685	2064
tac ctg ggt gtc ccc tcc tct ctg gtc atc att caa gtg gta cct ttc Tyr Leu Gly Val Pro Ser Ser Leu Val Ile Ile Gln Val Val Pro Phe 690	695	700	2112
ctg gtg ctg gct gtg gga gct gac aac atc ttc atc ttt gtt ctt gag Leu Val Leu Ala Val Gly Ala Asp Asn Ile Phe Ile Phe Val Leu Glu 705	710	715	2160
tac cag agg ctg cct agg atg ccc ggg gag cag cga gag gct cac att Tyr Gln Arg Leu Pro Arg Met Pro Gly Glu Gln Arg Glu Ala His Ile 725	730	735	2208
ggc cgc acc ctg ggt agt gtg gcc ccc agc atg ctg ctg tgc agc ctc Gly Arg Thr Leu Gly Ser Val Ala Pro Ser Met Leu Leu Cys Ser Leu 740	745	750	2256
tct gag gcc atc tgc ttc ttt cta ggg gcc ctg acc tcc atg cca gct Ser Glu Ala Ile Cys Phe Phe Leu Gly Ala Leu Thr Ser Met Pro Ala 755	760	765	2304
gtg agg acc ttt gcc ttg acc tct ggc tta gca atc atc ttt gac ttc Val Arg Thr Phe Ala Leu Thr Ser Gly Leu Ala Ile Ile Phe Asp Phe 770	775	780	2352
ctg ctc cag atg aca gcc ttt gtg gcc ctg ctc tcc ctg gat agc aag Leu Leu Gln Met Thr Ala Phe Val Ala Leu Leu Ser Leu Asp Ser Lys 785	790	795	2400
agg cag gag gcc tct cgc ccc gac gtc gtg tgc tgc ttt tca agc cga Arg Gln Glu Ala Ser Arg Pro Asp Val Val Cys Cys Phe Ser Ser Arg 805	810	815	2448
aat ctg ccc cca ccg aaa caa aaa gaa ggc ctc tta ctt tgc ttc ttc Asn Leu Pro Pro Lys Gln Lys Glu Gly Leu Leu Leu Cys Phe Phe 820	825	830	2496
cgc aag ata tac act ccc ttc ctg ctg cac aga ttc atc cgc cct gtt Arg Lys Ile Tyr Thr Pro Phe Leu Leu His Arg Phe Ile Arg Pro Val 835	840	845	2544
gtg ctg ctg ctc ttt ctg gtc ctg ttt gga gca aac ctc tac tta atg Val Leu Leu Leu Phe Leu Val Leu Phe Gly Ala Asn Leu Tyr Leu Met 850	855	860	2592
tgc aac atc agc gtg ggg ctg gac cag gat ctg gct ctg ccc aag gat Cys Asn Ile Ser Val Gly Leu Asp Gln Asp Leu Ala Leu Pro Lys Asp 865	870	875	2640
tcc tac ctg ata gac tac ttc ctc ttt ctg aac cgg tac ttg gaa gtg			2688



1115	1120	1125	
tac ctc cta ctg ggc ctg gac	ata cgc tca ggc atc	ctc aac ctg	3429
Tyr Leu Leu Leu Gly Leu Asp	Ile Arg Ser Gly Ile	Leu Asn Leu	
1130	1135	1140	
ctc tcc atc att atg atc ctc	gtg gac acc atc ggc	ctc atg gct	3474
Leu Ser Ile Ile Met Ile Leu	Val Asp Thr Ile Gly	Leu Met Ala	
1145	1150	1155	
gtg tgg ggt atc agc tac aat	gct gtg tcc ctc atc	aac ctt gtc	3519
Val Trp Gly Ile Ser Tyr Asn	Ala Val Ser Leu Ile	Asn Leu Val	
1160	1165	1170	
acg gca gtg ggc atg tct gtg	gag ttc gtg tcc cac	att acc cgg	3564
Thr Ala Val Gly Met Ser Val	Glu Phe Val Ser His	Ile Thr Arg	
1175	1180	1185	
tcc ttt gct gta agc acc aag	cct acc cgg ctg gag	aga gcc aaa	3609
Ser Phe Ala Val Ser Thr Lys	Pro Thr Arg Leu Glu	Arg Ala Lys	
1190	1195	1200	
gat gct act atc ttc atg ggc	agt gcg gtg ttt gct	gga gtg gcc	3654
Asp Ala Thr Ile Phe Met Gly	Ser Ala Val Phe Ala	Gly Val Ala	
1205	1210	1215	
atg acc aac ttc ccg ggc atc	ctc atc ctg ggc ttt	gct cag gcc	3699
Met Thr Asn Phe Pro Gly Ile	Leu Ile Leu Gly Phe	Ala Gln Ala	
1220	1225	1230	
cag ctt atc cag att ttc ttc	ttc cgc ctc aac ctc	ctg atc acc	3744
Gln Leu Ile Gln Ile Phe Phe	Phe Arg Leu Asn Leu	Leu Ile Thr	
1235	1240	1245	
ttg ctg ggt ctg cta cac ggc	ctg gtc ttc ctg ccc	gtt gtc ctc	3789
Leu Leu Gly Leu Leu His Gly	Leu Val Phe Leu Pro	Val Val Leu	
1250	1255	1260	
agc tat ctg ggg cca gat gtt	aac caa gct ctg gta	ctg gag gag	3834
Ser Tyr Leu Gly Pro Asp Val	Asn Gln Ala Leu Val	Leu Glu Glu	
1265	1270	1275	
aaa cta gcc act gag gca gcc	atg gtc tca gag cct	tct tgc cca	3879
Lys Leu Ala Thr Glu Ala Ala	Met Val Ser Glu Pro	Ser Cys Pro	
1280	1285	1290	
cag tac ccc ttc ccg gct gat	gca aac acc agt gac	tat gtt aac	3924
Gln Tyr Pro Phe Pro Ala Asp	Ala Asn Thr Ser Asp	Tyr Val Asn	
1295	1300	1305	
tac ggc ttt aat cca gaa ttt	atc cct gaa att aat	gct gct agc	3969
Tyr Gly Phe Asn Pro Glu Phe	Ile Pro Glu Ile Asn	Ala Ala Ser	
1310	1315	1320	
agc tct ctg ccc aaa agt gac	caa aag ttc taa		4002
Ser Ser Leu Pro Lys Ser Asp	Gln Lys Phe		
1325	1330		

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<213> Mus sp.

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Thr Phe Tyr Glu Glu Cys Gly Lys Asn Pro Glu Leu Ser Gly Gly Leu  
35 40 45

Thr Ser Leu Ser Asn Ile Ser Cys Leu Ser Asn Thr Pro Ala Arg His  
50 55 60

Val Thr Gly Asp His Leu Ala Leu Leu Gln Arg Val Cys Pro Arg Leu  
65 70 75 80

Tyr Asn Gly Pro Asn Asp Thr Tyr Ala Cys Cys Ser Thr Lys Gln Leu  
85 90 95

Val Ser Leu Asp Ser Ser Leu Ser Ile Thr Lys Ala Leu Leu Thr Arg  
100 105 110

Cys Pro Ala Cys Ser Glu Asn Phe Val Ser Ile His Cys His Asn Thr  
115 120 125

Cys Ser Pro Asp Gln Ser Leu Phe Ile Asn Val Thr Arg Val Val Gln  
130 135 140

Arg Asp Pro Gly Gln Leu Pro Ala Val Val Ala Tyr Glu Ala Phe Tyr  
145 150 155 160

Gln Arg Ser Phe Ala Glu Lys Ala Tyr Glu Ser Cys Ser Arg Val Arg  
165 170 175

Ile Pro Ala Ala Ala Ser Leu Ala Val Gly Ser Met Cys Gly Val Tyr  
180 185 190

Gly Ser Ala Leu Cys Asn Ala Gln Arg Trp Leu Asn Phe Gln Gly Asp  
195 200 205

Thr Gly Asn Gly Leu Ala Pro Leu Asp Ile Thr Phe His Leu Leu Glu  
210 215 220

Pro Gly Gln Ala Leu Ala Asp Gly Met Lys Pro Leu Asp Gly Lys Ile  
225 230 235 240

Thr Pro Cys Asn Glu Ser Gln Gly Glu Asp Ser Ala Ala Cys Ser Cys  
245 250 255

Gln Asp Cys Ala Ala Ser Cys Pro Val Ile Pro Pro Pro Ala Leu  
260 265 270

Arg Pro Ser Phe Tyr Met Gly Arg Met Pro Gly Trp Leu Ala Leu Ile  
275 280 285

Ile Ile Phe Thr Ala Val Phe Val Leu Leu Ser Val Val Leu Val Tyr  
290 295 300

Leu Arg Val Ala Ser Asn Arg Asn Lys Asn Lys Thr Ala Gly Ser Gln  
305 310 315 320

Glu Ala Pro Asn Leu Pro Arg Lys Arg Arg Phe Ser Pro His Thr Val  
325 330 335

Leu Gly Arg Phe Phe Glu Ser Trp Gly Thr Arg Val Ala Ser Trp Pro  
340 345 350

Leu Thr Val Leu Ala Leu Ser Phe Ile Val Val Ile Ala Leu Ser Val  
355 360 365

Gly Leu Thr Phe Ile Glu Leu Thr Thr Asp Pro Val Glu Leu Trp Ser  
370 375 380

Ala Pro Lys Ser Gln Ala Arg Lys Glu Lys Ala Phe His Asp Glu His  
385 390 395 400

Phe Gly Pro Phe Phe Arg Thr Asn Gln Ile Phe Val Thr Ala Lys Asn  
405 410 415

Arg Ser Ser Tyr Lys Tyr Asp Ser Leu Leu Leu Gly Pro Lys Asn Phe  
420 425 430

Ser Gly Ile Leu Ser Leu Asp Leu Leu Gln Glu Leu Leu Glu Leu Gln  
435 440 445

Glu Arg Leu Arg His Leu Gln Val Trp Ser His Glu Ala Gln Arg Asn  
450 455 460

Ile Ser Leu Gln Asp Ile Cys Tyr Ala Pro Leu Asn Pro His Asn Thr  
465 470 475 480

Ser Leu Thr Asp Cys Cys Val Asn Ser Leu Leu Gln Tyr Phe Gln Asn  
485 490 495

Asn His Thr Leu Leu Leu Thr Ala Asn Gln Thr Leu Asn Gly Gln  
500 505 510

Thr Ser Leu Val Asp Trp Lys Asp His Phe Leu Tyr Cys Ala Asn Ala  
515 520 525

Pro Leu Thr Tyr Lys Asp Gly Thr Ala Leu Ala Leu Ser Cys Ile Ala  
530 535 540

Asp Tyr Gly Ala Pro Val Phe Pro Phe Leu Ala Val Gly Gly Tyr Gln  
545 550 555 560

Gly Thr Asp Tyr Ser Glu Ala Glu Ala Leu Ile Ile Thr Phe Ser Ile  
565 570 575

Asn Asn Tyr Pro Ala Asp Asp Pro Arg Met Ala His Ala Lys Leu Trp  
580 585 590

Glu Glu Ala Phe Leu Lys Glu Met Gln Ser Phe Gln Arg Ser Thr Ala  
595 600 605

Asp Lys Phe Gln Ile Ala Phe Ser Ala Glu Arg Ser Leu Glu Asp Glu  
610 615 620

Ile Asn Arg Thr Thr Ile Gln Asp Leu Pro Val Phe Ala Ile Ser Tyr  
625 630 635 640

Leu Ile Val Phe Leu Tyr Ile Ser Leu Ala Leu Gly Ser Tyr Ser Arg  
645 650 655

Trp Ser Arg Val Ala Val Asp Ser Lys Ala Thr Leu Gly Leu Gly Gly  
660 665 670

Val Ala Val Val Leu Gly Ala Val Val Ala Ala Met Gly Phe Tyr Ser  
675 680 685

Tyr Leu Gly Val Pro Ser Ser Leu Val Ile Ile Gln Val Val Pro Phe

690

695

700

Leu Val Leu Ala Val Gly Ala Asp Asn Ile Phe Ile Phe Val Leu Glu  
 705 710 715 720

Tyr Gln Arg Leu Pro Arg Met Pro Gly Glu Gln Arg Glu Ala His Ile  
 725 730 735

Gly Arg Thr Leu Gly Ser Val Ala Pro Ser Met Leu Leu Cys Ser Leu  
 740 745 750

Ser Glu Ala Ile Cys Phe Phe Leu Gly Ala Leu Thr Ser Met Pro Ala  
 755 760 765

Val Arg Thr Phe Ala Leu Thr Ser Gly Leu Ala Ile Ile Phe Asp Phe  
 770 775 780

Leu Leu Gln Met Thr Ala Phe Val Ala Leu Leu Ser Leu Asp Ser Lys  
 785 790 795 800

Arg Gln Glu Ala Ser Arg Pro Asp Val Val Cys Cys Phe Ser Ser Arg  
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Asn Leu Pro Pro Pro Lys Gln Lys Glu Gly Leu Leu Leu Cys Phe Phe  
 820 825 830

Arg Lys Ile Tyr Thr Pro Phe Leu Leu His Arg Phe Ile Arg Pro Val  
 835 840 845

Val Leu Leu Leu Phe Leu Val Leu Phe Gly Ala Asn Leu Tyr Leu Met  
 850 855 860

Cys Asn Ile Ser Val Gly Leu Asp Gln Asp Leu Ala Leu Pro Lys Asp  
 865 870 875 880

Ser Tyr Leu Ile Asp Tyr Phe Leu Phe Leu Asn Arg Tyr Leu Glu Val  
 885 890 895

Gly Pro Pro Val Tyr Phe Asp Thr Thr Ser Gly Tyr Asn Phe Ser Thr  
 900 905 910

Glu Ala Gly Met Asn Ala Ile Cys Ser Ser Ala Gly Cys Glu Ser Phe  
 915 920 925

Ser Leu Thr Gln Lys Ile Gln Tyr Ala Ser Glu Phe Pro Asn Gln Ser  
 930 935 940

Tyr Val Ala Ile Ala Ala Ser Ser Trp Val Asp Asp Phe Ile Asp Trp  
945 950 955 960

Leu Thr Pro Ser Ser Cys Cys Arg Ile Tyr Thr Arg Gly Pro His  
965 970 975

Lys Asp Glu Phe Cys Pro Ser Thr Asp Thr Ser Phe Asn Cys Leu Lys  
980 985 990

Asn Cys Met Asn Arg Thr Leu Gly Pro Val Arg Pro Thr Thr Glu Gln  
995 1000 1005

Phe His Lys Tyr Leu Pro Trp Phe Leu Asn Asp Thr Pro Asn Ile  
1010 1015 1020

Arg Cys Pro Lys Gly Gly Leu Ala Ala Tyr Arg Thr Ser Val Asn  
1025 1030 1035

Leu Ser Ser Asp Gly Gln Ile Ile Ala Ser Gln Phe Met Ala Tyr  
1040 1045 1050

His Lys Pro Leu Arg Asn Ser Gln Asp Phe Thr Glu Ala Leu Arg  
1055 1060 1065

Ala Ser Arg Leu Leu Ala Ala Asn Ile Thr Ala Glu Leu Arg Lys  
1070 1075 1080

Val Pro Gly Thr Asp Pro Asn Phe Glu Val Phe Pro Tyr Thr Ile  
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Ser Asn Val Phe Tyr Gln Gln Tyr Leu Thr Val Leu Pro Glu Gly  
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Tyr Leu Leu Leu Gly Leu Asp Ile Arg Ser Gly Ile Leu Asn Leu  
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Ala Glu Ala Gly Leu Arg Gly Trp Leu Leu Trp Ala Leu Leu Arg		
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Leu Ala Gln Ser Glu Pro Tyr Thr Ile His Gln Pro Gly Tyr Cys		
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gcc ttc tat gac gaa tgt ggg aag aac cca gag	ctg tct gga agc ctc	203
Ala Phe Tyr Asp Glu Cys Gly Lys Asn Pro Glu Leu Ser Gly Ser Leu		
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atg aca ctc tcc aac gtg tcc tgc ctg tcc aac acg	ccg gcc cgc aag	251
Met Thr Leu Ser Asn Val Ser Cys Leu Ser Asn Thr Pro Ala Arg Lys		
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Ile Thr Gly Asp His Leu Ile Leu Gln Lys Ile Cys Pro Arg Leu		
70	75	80

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Tyr Thr Gly Pro Asn Thr Gln Ala Cys Cys Ser Ala Lys Gln Leu Val		
85	90	95

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Ser Leu Glu Ala Ser Leu Ser Ile Thr Lys Ala Leu Leu Thr Arg Cys		
100	105	110

cca gcc tgc tct gac aat ttt gtg aac ctg cac tgc	cac aac acg tgc	443
Pro Ala Cys Ser Asp Asn Phe Val Asn Leu His Cys His Asn Thr Cys		
115	120	125

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165 170 175	
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260 265 270	
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310 315 320	
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325 330 335	
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Asn Arg Thr Thr Ala Glu Asp Leu Pro Ile Phe Ala Thr Ser Tyr Ile			
630	635	640	
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Val Ile Phe Leu Tyr Ile Ser Leu Ala Leu Gly Ser Tyr Ser Ser Trp			
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Ser Arg Val Met Val Asp Ser Lys Ala Thr Leu Gly Leu Gly Val			
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Ala Val Val Leu Gly Ala Val Met Ala Ala Met Gly Phe Phe Ser Tyr			
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Val Leu Ser Val Gly Ala Asp Asn Ile Phe Ile Phe Val Leu Glu Tyr			
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Gln Arg Leu Pro Arg Arg Pro Gly Glu Pro Arg Glu Val His Ile Gly			
725	730	735	
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Arg Ala Leu Gly Arg Val Ala Pro Ser Met Leu Leu Cys Ser Leu Ser			
740	745	750	
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Glu Ala Ile Cys Phe Phe Leu Gly Ala Leu Thr Pro Met Pro Ala Val			
755	760	765	
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Arg Thr Phe Ala Leu Thr Ser Gly Leu Ala Val Ile Leu Asp Phe Leu			
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ctg cag atg tca gcc ttt gtg gcc ctg ctc tcc ctg gac agc aag agg			2459
Leu Gln Met Ser Ala Phe Val Ala Leu Leu Ser Leu Asp Ser Lys Arg			
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Gln Glu Ala Ser Arg Leu Asp Val Cys Cys Cys Val Lys Pro Gln Glu			
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Leu Pro Pro Pro Gly Gln Gly Glu Gly Leu Leu Gly Phe Phe Gln			
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aag gct tat gcc ccc ttc ctg ctg cac tgg atc act cga ggt gtt gtg			2603
Lys Ala Tyr Ala Pro Phe Leu Leu His Trp Ile Thr Arg Gly Val Val			
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Leu Leu Leu Phe Leu Ala Leu Phe Gly Val Ser Leu Tyr Ser Met Cys			

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gct ggg atg aat gcc atc tgc tcc agt gca ggc tgc aac aac ttc tcc Ala Gly Met Asn Ala Ile Cys Ser Ser Ala Gly Cys Asn Asn Phe Ser	915	920	925	2843	
ttc acc cag aag atc cag tat gcc aca gag ttc cct gag cag tct tac Phe Thr Gln Lys Ile Gln Tyr Ala Thr Glu Phe Pro Glu Gln Ser Tyr	930	935	940	945	2891
ctg gcc atc cct gcc tcc tcc tgg gtg gat gac ttc att gac tgg ctg Leu Ala Ile Pro Ala Ser Ser Trp Val Asp Asp Phe Ile Asp Trp Leu	950	955	960		2939
acc ccg tcc tcc tgc tgc cgc ctt tat ata tct ggc ccc aat aag gac Thr Pro Ser Ser Cys Cys Arg Leu Tyr Ile Ser Gly Pro Asn Lys Asp	965	970	975		2987
aag ttc tgc ccc tcg acc gtc aac tct ctg aac tgc cta aag aac tgc Lys Phe Cys Pro Ser Thr Val Asn Ser Leu Asn Cys Leu Lys Asn Cys	980	985	990		3035
atg agc atc acg atg ggc tct gtg agg ccc tcg gtg gag cag ttc cat Met Ser Ile Thr Met Gly Ser Val Arg Pro Ser Val Glu Gln Phe His	995	1000	1005		3083
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ccc aaa ggc ggc ctg gca gca tac agc acc tct gtg aac ttg act Pro Lys Gly Gly Leu Ala Ala Tyr Ser Thr Ser Val Asn Leu Thr	1025	1030	1035		3173
tca gat ggc cag gtt tta gac aca gtt gcc att ctg tca ccc agg Ser Asp Gly Gln Val Leu Asp Thr Val Ala Ile Leu Ser Pro Arg	1040	1045	1050		3218
ctg gag tac agt ggc aca atc tcg gct cac tgc aac ctc tac ctc Leu Glu Tyr Ser Gly Thr Ile Ser Ala His Cys Asn Leu Tyr Leu	1055	1060	1065		3263
ctg gat tca gcc tcc agg ttc atg gcc tat cac aag ccc ctg aaa Leu Asp Ser Ala Ser Arg Phe Met Ala Tyr His Lys Pro Leu Lys	1070	1075	1080		3308
aac tca cag gat tac aca gaa gct ctg cgg gca gct cga gag ctg Asn Ser Gln Asp Tyr Thr Glu Ala Leu Arg Ala Ala Arg Glu Leu	1085	1090	1095		3353

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265

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Ile Ser Leu Gln Asp Ile Cys Tyr Ala Pro Leu Asn Pro Asp Asn Thr  
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Ser Leu Tyr Asp Cys Cys Ile Asn Ser Leu Leu Gln Tyr Phe Gln Asn  
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His Lys Tyr Leu Pro Trp Phe Leu Asn Asp Arg Pro Asn Ile Lys  
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Cys Pro Lys Gly Gly Leu Ala Ala Tyr Ser Thr Ser Val Asn Leu  
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